15¢

July 21, 1951

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Welding Jets

See Page 44

A SCIENCE SERVICE PUBLICATION

$5.00 A YEAR

VOL. 60 NO. 3 PAGES 33-48

MEDICINE

Alcoholics Not "Skid-Row"

Records of outpatient clinics show a new group of alcoholics who are not "common drunks" from "skid row" destined to end in jail.

➤ A NEW group of alcoholics, "perhaps the most significant element in the entire alcoholic population," is coming to light through the growing outpatient clinics for treatment of alcoholism.

Previous lay and medical opinion about alcoholics is being proved wrong by the records of these clinics, Drs. Robert Straus and Selden D. Bacon of the Yale Center of Alcohol Studies report in the QUARTERLY JOURNAL OF STUDIES ON ALCOHOL (June).

Alcoholics are not all "common drunks" from "skid row," destined to end in the jails or mental hospitals, the Yale scientists find. In a study of over 2,000 men patients at nine outpatient alcoholism clinics, they found the following facts:

1. Over half married and living with their wives. The percentage who had never married no greater than normal expectancy. Three out of four living in an established household, nine out of 10 at least two-year residents of the same town.

2. More than 80% under 50 years, a fourth under 35.

3. Nearly two-thirds gainfully employed. Over half with steady employment on the same job for at least three years, 25% for at least 10 years. At least seven out of 10 holding jobs involving special skills or responsibility.

4. A fifth of the patients came to clinics on their own initiative, another fifth at suggestion of friends or relatives, 12% through Alcoholics Anonymous and 12% through the courts. Only two per cent referred by employers.

Cure figures are not given, but clinic staff members estimate that 40% to 60% of the patients who keep in contact with the clinics "have been measurably helped in respect to their alcoholism as well as in their underlying problems of adjustment."

Because this segment of the alcoholic population has not yet deteriorated to "skid row," and because of the investment in those holding positions of skill and responsibility, the Yale scientists point out, public outpatient clinics which rehabilitate alcoholics are playing an important role.

Science News Letter, July 21, 1951

GENERAL SCIENCE

Survey Science Manpower

➤ SEVERAL STUDIES to determine where the nation stands on one of its most precious and scarce defense resources—scientific manpower—will shortly be undertaken by the government.

Right now, future needs for physicists, chemists and engineers to develop new weapons and equipment and to keep up the civilian economy are not known. Wide discrepancies appear in the various estimates, although most officials are agreed that the nation is faced with a serious shortage in the years ahead.

Future needs for engineers, for instance, are estimated as between 30,000 and 85,000 new graduates each year. In other fields the informed guesses are just as varied.

The Manpower Division of Charles E. Wilson's Office of Defense Mobilization will shortly set up a task force to bring some order out of this statistical chaos. A five-man group representing the Defense Department, the Labor Department, the National Research Council and other interested parties will establish a master plan for getting the required information. Once this plan is devised, probably by the end of July, defense planners will have a chance to know just how short the scientific manpower shortage will be in future years.

Another study, which will mesh into this one, will be conducted by the National Research Council's Office of Scientific Personnel for the new National Science Foundation. This will be an annual inventory of young men and women in training in the nation's colleges and graduate schools in the various sciences.

With the two studies the nation will know what scientific manpower needs are and what is coming from the schools to fill those needs.

Science News Letter, July 21, 1951

GENERAL SCIENCE

18,000,000 Civil Defense Pamphlets on First Aid

➤ THE FEDERAL Civil Defense Administration has published 6,000,000 copies of a booklet telling untrained first-aiders what not to do to persons injured in A-bomb attacks.

Simultaneously, the FCDA published a four-page brochure describing the essential requirements for a home first-aid kit. Twelve million copies of this brochure were printed. Also this brochure makes up the four middle pages of "Emergency Action to Save Lives," the "what not to do" booklet.

The "what not to do" booklet tells untrained persons to leave the injured alone, unless they are in danger of further injury or death from falling buildings, debris, fire or flood.

FCDA and the American Red Cross hope there will be enough trained first-aid personnel around to take care of A-bomb victims. The Red Cross has said that more than 10,000,000 first-aiders are wanted.

The four-page first-aid kit brochure recommends the simplest essentials, such as old towels to be used for bandages, salt and soda. Most of the kit's equipment, it is believed, can already be found in the average home. None of the pamphlets bears the FCDA name, rather a space has been left for the names of state civil defense organizations and the 12,000,000 are being distributed to the states.

The 6,000,000 "Emergency Action to Save Lives" pamphlets, however, bear the FCDA label.

Science News Letter, July 21, 1951

TECHNOLOGY

Anti-Bacterial Cement Effective in 9-Year Test

➤ A CEMENT treatment that checks the growth of bacteria and fungus on the floors and walls of dairies, school gymnasiums, locker and shower rooms, restaurant kitchens and chemical plants is reported to be satisfactory after nine years of testing.

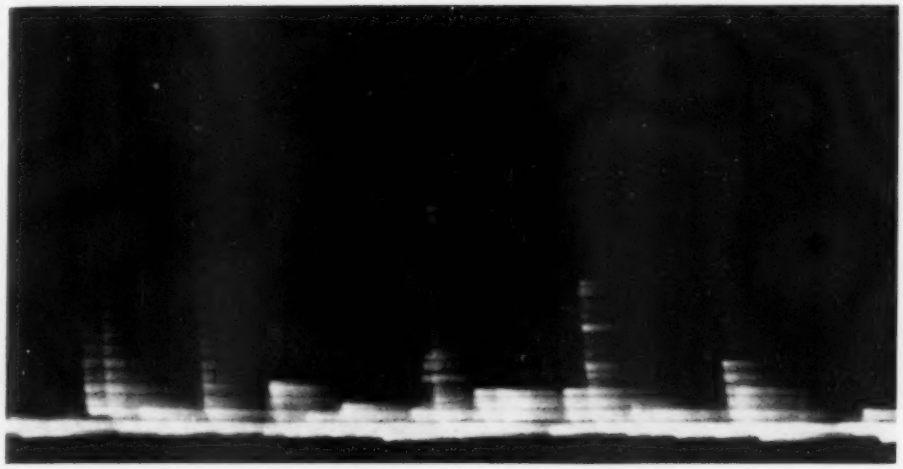
Dr. William J. Knapp of the University of California at Los Angeles helped Dr. Charles R. Amberg develop the anti-bacterial cement at the New York State College of Ceramics at Alfred, N. Y. Anti-bacterial cement carries seven-tenths of one per cent pentachlorophenol, a fungicide sometimes used to preserve railroad ties and telephone poles.

A dairy floor laid in 1942 is still proving highly anti-bacterial, says Dr. Knapp. Tests have shown that the new cement held from 54% to 96% less bacteria than ordinary cement.

Scrubbed and washed with strong soaps, the anti-bacterial qualities of the cement actually increased. This is because the bacteria inhibiting agent is less soluble in water than cement itself.

However, the anti-bacterial cement has no effect on normal human skin. A pat of the cement was taped to a man's arm for 52 hours without results of any kind. The skins of guinea pigs showed no reaction after being rubbed with the cement three times a day for two weeks.

Science News Letter, July 21, 1951



LIGHTNING BRIGHTENS SKY—The entire sky is temporarily brightened by a flash of lightning. The long white line in this photograph represents the sky brightness facing away from the flash, the tall pips show the change in brightness with each discharge. These changes occurred in 1/10 of a second.

ASTRONOMY

Whole Sky Brightened

Lightning flashes illuminate entire sky, not just part in which they occur. Photomultiplier caught the light changes during study of twinkling.

➤ A FLASH of lightning not only illuminates the part of the sky in which it occurs, but temporarily brightens the entire sky many times.

Such brightening of the sky away from a flash has just been recorded by A. A. Hoag of the U. S. Naval Observatory. The relative brightness of each discharge and its duration is clearly registered.

The light changes were caught by a photomultiplier, a sensitive light receiver. This is probably the first time that a device of this type has been used to study lightning.

The lightning occurred quite opportunely when Mr. Hoag was trying to measure the over-all twinkling of a part of the sky. His equipment was simple—a large cardboard box with a hole in one end and in the other a photomultiplier which converts the light into electrical impulses. These impulses caused "pips" on the attached oscilloscope screen. A continuously moving film camera permanently recorded the pips.

The instrument was facing the south. With the sky still nine-tenths clear, a thunderstorm appeared in the northwest. Thus the instrument caught not the lightning itself, but the brightness of the sky due to the scattering of the light from the lightning.

Looking like a futuristic representation of a city skyline at night when all lights are ablaze, each lightning discharge shows up as a tall, many-storied building. The height of the "building" is governed by the intensity of the discharge.

Blurring caused single up and down lines on the screen to be spread out and gives apparent width to the "buildings."

Thus the equipment proved an excellent means of measuring the time between individual discharges and their relative intensities.

Usually the intense light disappeared from the sky within a thousandth of a second. But light from one discharge lasted 30 times this long, turning the "building" into a steeply pitched roof.

"Equipment of this type might be useful in monitoring a thunderstorm," Mr. Hoag pointed out. "It would record all lightning flashes in the storm."

Unfortunately, the photomultiplier does not separate out individual flashes, Mr. Hoag said. If two flashes occur simultaneously, it will show a single great increase in brightness in the sky. Perhaps a rotating camera, frequently used in study of lightning, should be used along with it to record the flashes themselves and give a complete picture of the lightning.

Science News Letter, July 21, 1951

PHYSICS

Something in it Despite Title: Vacuum

➤ THERE IS something in the latest scientific journal, VACUUM, despite its name. This new British publication, to be issued quarterly, contains information on high-vacuum techniques and processes which have become of greater importance in science and industry in the past three decades.

Science News Letter, July 21, 1951

MEDICINE

Treat Arthritis Successfully With Postpartum Plasma

➤ ARTHRITIS CAN be successfully treated, even in cases where cortisone and ACTH are not effective, by use of fluids recovered after childbirth, known as postpartum plasma, Dr. Louis W. Granirer of Jamaica, N. Y., reports in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 14).

Although the treatments are administered only once a week, the pooled postpartum plasma is reported to have produced a gradual and sustained remission in 13 out of 15 patients treated during the past three years, while the two patients who failed to respond had a short course of therapy of only six treatments.

Patients who were unable to close their hands due to crippling rheumatism and swelling joints were able to clinch their fists after treatments.

They gained weight, felt better, lost chemical abnormalities in their blood, had no serum effects and experienced no side effects as in treatments with ACTH and cortisone.

Science News Letter, July 21, 1951

ICHTHYOLOGY

Little Fish Survive 1,000 Lb./Sq. In. Pressure

➤ SHALLOW-WATER fingerling trout and salmon are indestructible in the crushing pressures of the sea, 2,000 feet below the surface where a man—even in a diving suit—cannot live.

The experiments that established this fact were conducted by Andreas Rechnitzer who wanted to observe the reaction of young fish to high hydrostatic pressures.

The small, frail-looking fish showed no apparent damage after being in water in pressures up to 1,000 pounds per square inch, the equivalent of water approximately two-fifths of a mile deep.

Origin of the experiments was the desire to know if small fish could survive rapid descents from high levels necessitated by devices proposed by engineers to allow passage of fingerlings down dammed streams.

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ENTOMOLOGY

Fewer Borers in Corn

"Very light infestation" by dread corn borers forecast for year's first batch of worms, though late summer attacks could be heavy.

➤ HOUSEWIVES AS well as farmers and canners can breathe a sigh of relief. They will probably find fewer of the dread corn borers eating up their corn this year.

A hopeful forecast of "very light infestation" by corn borers was made by U. S. Department of Agriculture officials to SCIENCE SERVICE. They based their estimate on survey reports turned into the Bureau of Entomology and Plant Quarantine during June and July.

"It is, however, still to early to tell definitely about late summer attacks from this pest," Bureau entomologist Kenneth Haynes stated. "Proper weather conditions may set up a feast table for this year's second crop of worms, even though the first batch has so far proved light."

About five weeks are required for the corn borer to grow to maturity and lay its eggs. These hatch into the young larvae or worms, that bore into the stem, the stalk or the ear of corn, producing two and even more broods of the injurious insects during a single growing season.

The best ways to beat the corn borer's attack are by thorough clean-up of the crop residues, spraying or dusting plants with DDT, the deadly parathion or other prescribed insecticides, and planting borer-resistant corn.

The European corn borer was first discovered in this country near Boston 40 years ago. Since that time, it has slowly chewed its way westward and is still spreading. It wormed its way into 17 previously unattacked counties in seven states during 1950.

Cash value of the crops it destroyed last year: nearly $85,000,000, compared to $350,000,000 in 1949. Department officials are hoping the damage will be even lighter this year.

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AERONAUTICS

Turbo-Compound Engines Power New Flying Boat

➤ A NOTABLE feature of the new Martin Marlin flying boat, which recently made its first flying test, is the reciprocating engine-turbine combination with which it is powered. This gives great power for takeoff from rough water and extreme fuel economy for its long-range flights.

The engine is built by Wright Aeronautical Corporation, Woodridge, N. J., and is claimed to be the only compound aircraft engine now in production. It is a combination of a standard 18-cylinder Cyclone engine and three small turbines.

These turbines are driven by the exhaust gas of the Cyclone. They generate approximately 500 horsepower by themselves but do not require the use of additional fuel by the engine. This means a total of about 20% more power with no additional fuel consumption, and relatively little addition in size or weight to the power plant.

The new flying boat in which the engine is in use, a product of the Glenn L. Martin Company, Baltimore, Md., and built for the U. S. Navy, is designed as an anti-submarine weapon. Officially it is the Martin P5M-1 Marlin. It is a huge, gull-winged seaplane, powered by two of the Wright turbo-compound engines, each developing 3,250 horsepower. Its wingspan is 118 feet. Its length is approximately 90 feet.

Another notable feature of this new seaplane is its long so-called afterbody, the keel and the lower part of the hull being under water from near the nose to the sternpost. This afterbody makes for better landings and takeoffs in rough water. Maneuvers in the water are aided by a pair of hydroflaps, underwater rudders on each side of the hull near the tail.

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Question Box

ARCHITECTURE

What type of design can be used to save costs in building construction? p. 40.

BOTANY

What are honey mushrooms? p. 44.

HORTICULTURE

What are watermelon "hammocks?" p. 42.

MEDICINE

What chemical is being tested against TB in Warsaw? p. 38.

Against what childhood disease is terramycin effective? p. 39.

OPHTHALMOLOGY

How was it shown that a pilot with only one eye can safely land a plane? p. 39.

PSYCHOLOGY

What may well be the reason for a shower of leaflets on Seattle? p. 41.

PUBLIC HEALTH

What percentage of births in the U. S. are assisted by doctors? p. 41.

TECHNOLOGY

What chemical from beef tallow is helping oil production? p. 40.

Photographs: Cover, Dan Frankforter; p. 35, U. S. Naval Observatory; p. 37, Ezra Stoller; p. 39, U. S. Air Force; p. 42, U. S. Department of Agriculture.

SCIENCE NEWS LETTER
VOL. 60 JULY 21, 1951 No. 3

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 2-4822.

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GENERAL SCIENCE

For Science Understanding

For the youth of America, a great national quest for knowledge in the sciences is needed. The existing groundwork presents an opportunity.

A statement by the Director of Science Service:

➤ AMERICA today needs a great national quest for knowledge and understanding of the sciences. Already a million and more boys and girls in the high schools of America are eager to do things in science, and many of them are doing so now. Almost as many more adults, people who may not have had a chance to study the sciences in college, would find satisfaction, inspiration and personal development in science as an avocation.

The benefits to America and to the world that would result from an accelerated development of this science program would be most effective and gratifying.

America needs such a great quest for knowledge and science understanding. Operating in the schools it would kindle the sparks of interest and genius latent in our youth. Extending into our communities as a hobby and educational opportunity for adults it will bring great personal satisfaction and explain the fundamentals of American material and spiritual development.

For the future of America—for peaceful living, for industrial progress, for a successful democracy, for a strong and prepared nation—this quest for science understanding must be accomplished.

The foundations of this great movement have been built in the youth activities of SCIENCE SERVICE's Science Clubs of America. There are about 10,000 affiliated clubs in every state—and almost every county, city and town of the land. A third of a million members are on the rolls of these clubs.

State science academies, colleges, teacher associations, museums, newspapers, and other organizations are cooperating. In 32 of the 48 states, there are statewide movements as a part of the Science Clubs of America development. In some of the larger states there are regional organizations as well.

The National Science Talent Search for the Westinghouse Science Scholarships is now in its 11th year. This is a nationwide selection of the high school seniors who are most likely to be creative scientists of the future. The selections are made through a vigorous competition based upon results of science aptitude examinations, recommendations, evaluations and science project reports. In all, 3,000 boys and girls have been picked for honors, and the National Science Talent Search has been extended into the states through the utilization by state committees of the entries for further honors.

The Science Talent Search has pioneered the recogntion by the educational and scientific world that those with talent can be picked successfully at the high school level.

The work of science clubs is culminated in science fairs and congresses held as part of the science movement in about 40 localities. Science fairs attracting up to 1,500 entries in some cases are held annually. Newspapers and educational institutions cooperate in sending winners from these affairs to the National Science Fair, the second of which was held in St. Louis in May, 1951.

The "grass-roots" of science understanding is the typical club or group in a high school in some town or big city. Science is the hobby as well as the study of each boy and girl among the 20 to 30 members. A teacher who likes science as he enjoys teaching youth, is the "sponsor." During noon hours, in class time, after school, on Saturdays, the science club members work on their projects—investigations of varying degrees of difficulty, originality and importance. The whole range of human interest and science is spanned—everything from astronomy to zoology—inventions, aids to health for the neighbors, insect collections, study of rocks, building of mechanical models, raising of animals, weather observations, food tests, chemical experiments, and thousands of other projects.

Some of these are scientists of tomorrow—and all are the citizens of tomorrow who will use and understand science.

This great structure of science for youth—primarily in our senior and junior public high schools and in our private and parochial secondary schools—has been built in the years since Pearl Harbor. (In 1941 there were only 700 clubs nationally organized.) The national network of clubs has been organized and each club has been supplied *free* with basic materials for fruitful activity. This is a minimum activity, nevertheless.

Now there should be much more service to these youthful scientists. The need is greater, for we realize more keenly the importance of the facts, the utility and the philosophy of the sciences.

Of equal importance to the youth movement would be the development and stimulation of adult hobby and avocational interest in science. A certain number of the clubs in Science Clubs of America do have adult membership.

SYNTHETIC CORTISONE—From the Mexican roots, "cabeza de negra" —meaning "black head"—carried on this boy's shoulder, come the substances used in the synthesis of cortisone. (See SNL, July 14.)

Participation of adults in science activities could be developed so that numerically it would be just as large, perhaps even larger, than the participation of youth in such activities. A study made in Philadelphia some years ago showed that there were as many amateurs of adult age as there were science club members.

SCIENCE SERVICE is the national educational and scientific institution, not for profit, with trustees nominated by the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science, the journalistic profession and the E. W. Scripps Estate. In operation since 1921, it is equipped by years of experience, staff, physical plant, and contacts with the educational and scientific work to undertake the contemplated essential educational service to be performed.

The popularization of science and its understanding by the people is the objective of SCIENCE SERVICE. Thirty years ago when we began, science was not considered news by newspapers. We created science reporting as an accepted part of the American scene. We serve several hundred newspapers reaching many millions of readers with SCIENCE SERVICE news and feature articles. We pioneered in science on the radio. Our personal subscription services are important. Our weekly SCIENCE NEWS LETTER magazine has a significant circulation. THINGS OF SCIENCE is a unique monthly service. CHEMISTRY magazine covers an important field. We are a national center for science information.

The science youth movement developed by SCIENCE SERVICE has been financed modestly out of the limited resources available through income from our non-profit activities, largely publications, supplemented by a limited income from the original E. W. Scripps endowment.

The opportunities for investment in the science of the future now far outrun the resources available. We are proud of what has been accomplished. Our service to the science clubs can not be placed on a self-supporting basis, as some of our other pioneering science popularization efforts have been. We feel justified in suggesting that financial aid be given our activities, particular those in the science club field, in order that the urgent opportunities be realized. We shall discuss gladly in detail the possibilities.

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PUBLIC HEALTH

Aerosol Process for BW

Enemy biological warfare agents could spread death easier by making use of aerosol process, familiar in method for killing mosquitoes.

➤ ENEMY BIOLOGICAL warfare agents have a much simpler problem in spreading death if they make use of the "aerosol" process familiar to thousands who use it to kill mosquitoes or make whipped cream. By spraying disease agents through the air—which is what the aerosol process does—they can leave out some of the steps to infection usually necessary in natural disease.

Drs. S. Edward Sulkin and Robert M. Pike of the Southwestern Medical School of the University of Texas found that laboratory-acquired infections do not always follow the pathways of transmission established for the naturally occurring disease. Yellow fever, they pointed out, developed in laboratory workers in the absence of mosquitoes to carry it. A venereal disease, lymphogranuloma venereum, developed without the usual contact between persons.

The two scientists attributed this to the release in the laboratory of agents "properly dispersed in the environment." This means that the agents were thrown out into the air of the laboratory in a fashion such as is done by an aerosol bomb, or might be done from an enemy plane.

More than 70 different disease-producing agents were involved in the study done by the two scientists for the government's National Institutes of Health. Bacteria, viruses, fungi, rickettsiae and protozoa were represented.

They concluded that "these examples should be of interest to those concerned with protection against biological warfare because they suggest that even in the absence of some of the links in the usual chain of transmission a given agent might be a potential danger if properly dispersed in the environment."

Their conclusions appear in the journal, SCIENCE (July 13).

Science News Letter, July 21, 1951

MEDICINE

New Chemical Tested Against TB in Warsaw

➤ HOPE OF a new chemical for use in treating tuberculosis is reported from Warsaw where a scientific team is beginning tests upon human patients.

The new chemical is called T 28. It is reported in a communication to the British journal, NATURE (July 7), as a substance active against tuberculosis in the test tube and in guinea pigs, with low toxicity. Chemically the product was prepared by the action of sodium hydrogen sulfite on 5-nitroso-8-hydroxyquinoline.

In the guinea pigs infected with tuberculosis, T 28 was not as effective as streptomycin, which is being used widely in treating some kinds of tuberculosis. It is nevertheless being tested clinically.

The investigators were Drs. T. Urbanski, S. Slopek, and J. Venulet.

Science News Letter, July 21, 1951

ENTOMOLOGY

Light Helps Hatching Of Damaging Mite

➤ LIGHT PLAYS an important part in the hatching of the fruit tree red spider, a mite that does extensive damage to common fruit trees in Europe, the United States and Canada.

This eight-legged pest belongs to the same family as spiders and is therefore not a true insect. The mite's damage is not inflicted directly upon the fruit, but its sucker-mouth robs the fruit tree leaves of sap, thus weakening the tree and making the leaf a less effiecient factory for changing sunlight into energy.

Although only about half-pinhead size, the female red spider is nevertheless prolific—laying hundreds of eggs, usually on the tree's twigs, before dying. If laid in the fall, the eggs do not hatch until the following spring, and it is these winter-eggs, Dr. H. J. Hueck of the University of Leyden in Holland reports in the journal, NATURE (June 16), whose hatchings are influenced by light. More break through the shell when exposed to the daylight than when kept in the dark. By passing light through variously colored filters, he also found that a considerably higher percentage of eggs hatched in blue light than in red.

Science News Letter, July 21, 1951

INVENTION

Patent Bed Mattress Designed for Invalids

➤ BED MATTRESS with a compressible center section, designed particularly for invalids, permits sanitary facilities to be inserted under a bedridden patient without moving the person. Compression of this mid-section is made with the aid of straps passing through it and mechanism by which tension is easily applied to them. Inventors are Alexarena Hay, Glace Bay, and Starr R. McLeod, Sydney, both in Nova Scotia, Canada. Patent 2,559,956 was awarded to them.

Science News Letter, July 21, 1951

MOTION TESTER—In his laboratory at the Air Force School of Aviation Medicine, Dr. Heinrich W. Rose (standing) examines a subject with the motion parallax tester for visual depth perception. On the acuity of depth perception, among other factors, depends the subject's ability to land an airplane.

OPHTHALMOLOGY

One-Eyed Person Can Pilot

Distance of moving objects can be judged with one eye alone, new type of test using movable wires mounted on a frame shows.

➤ A PILOT with only one eye can land an airplane safely.

Just how a one-eyed person is able to judge distance, depth, and speed as he must to make a plane landing is revealed by Dr. Heinrich W. Rose, research fellow at the U. S. Air Force School of Aviation Medicine, Randolph Field, Texas.

Distance of moving objects, Dr. Rose found, can be judged with one eye alone through the familiar fact that objects close by appear to move faster than those farther away. The train in which you may be riding seems to be going faster if you look at the telegraph poles beside the track than if you keep your eye on the mountains in the far distance.

A new type of test for distance perception designed by Dr. Rose has three wires mounted on a frame that moves rapidly up or down. The outer wires are fixed; the middle wire can be shifted nearer or farther away. The person tested adjusts this middle wire until it seems to him at the same distance as the other two.

The average pilot can tell whether the middle wire is in front of the others or behind them from its apparent speed in relation to theirs. He can tell with only one eye open as well as with two.

Dr. Rose's test is called the "motion parallax tester;" it will probably keep some pilots in the air who would otherwise be grounded because their two eyes do not work well together in binocular vision.

Dr. Rose became interested in this research when he was a flight surgeon with the German Luftwaffe. One day he waited with his ambulance to pick up a pilot who had sent word by radio that one eye had been shot away. Instead of crashing, as was expected, the one-eyed pilot came in for a perfect three-point landing.

Recommendation by Dr. Rose: Plant rows of small evergreens along runways as an aid to the approaching pilot.

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There are many varieties of *bats* throughout the world; some live entirely on fruit for food, some on insects, and then there is the vampire bat that feeds entirely on fresh blood.

PHYSICS

This Time Americans Claim Doing It First

➤ A GROUP of American physicists are figuring that they have a right to claim Stalin prizes for themselves.

Boris G. Lazarev, a Soviet physicist, was awarded a Stalin prize a few months ago for a new method of enrichment of helium with light isotopes. Early last year he and an assistant, B. N. Eselson, published a method used to separate the hydrogen isotope, tritium, from helium. (Tritium is one of the supposed materials of the hydrogen super-bomb.)

But C. T. Lane of Yale points out in a comment to the American Institute of Physics (PHYSICS TODAY, July) that in 1947, he, H. A. Fairbank of Yale, A. O. C. Nier and L. T. Aldrich of University of Minnesota published the same "heat-flush" seperation method.

Science News Letter, July 21, 1951

MEDICINE

Terramycin Effective Against Children's Whoops

➤ WHOOPING COUGH can be treated effectively by the antibiotic, terramycin.

This common and serious childhood infection was reduced in the duration of the whoop stage by about 60% in clinical tests at the Charles V. Chapin Hospital, Providence, R. I., where terramycin, chloromycetin and aureomycin were used on comparable cases. All three antibiotics helped recovery and were judged to be of almost equal clinical value.

Terramycin was found also at the University of Washington School of Medicine to be as effective as the other two antibiotics previously reported useful in whooping cough treatment.

Science News Letter, July 21, 1951

INVENTION

Heating System Combines Heat Pump and Solar Energy

➤ A SPECIALLY designed and constructed dwelling which is heated from a combination of the so-called heat pump and solar energy brought patent 2,559,871 to Frazer W. Gay, Metuchen, N. J. The patent covers both the house structure and the heating system.

The building itself has insulated sidewalls so constructed that air may circulate through them, and these walls extend down into the earth below the floor. This earth, directly below the floor, is used to store heat picked up by the heat pump to make it available during extreme cold weather. A solar heat trap, on the south wall of the house, captures radiation from the sun for use as the principal heat for the building.

Science News Letter, July 21, 1951

TECHNOLOGY

Chemical from Beef Tallow Aids Oil Well Production

➤ A CHEMICAL made from beef tallow by Armour and Company is being experimentally but successfully used to help get additional crude oil from petroleum wells after production by ordinary pumping becomes low. It is an animal oil that may help increase the world's oil supply.

When an oil well is near the end of its production by ordinary pumping, much oil still remains in the oil-bearing sand. Several methods have been developed to recover this remaining oil which may be up to one half of the original crude in the sands. One is by the use of natural gas or air introduced into the sands from the surface by compressors forcing the gas or air down a central bore. Another is by use of water pressure.

The water washes oil in the sands to the pumping wells for removal to the surface. Chemicals are used to make the water more effective. This new chemical, called Ethomid HT-60 by Armour, is said to be particularly effective and may increase the total amount of oil a well may produce as much as 10%.

Another chemical is used at the same time. It is what chemists call a quaternary ammonium compound. This is a derivative of ammonium hydroxide and is employed to prevent corrosion of the water pipe and equipment. What is called Arquad 2C is the quaternary found most effective.

Science News Letter, July 21, 1951

MEDICINE

Too Much Vitamin A Poisons Adult Patient

➤ YOU CAN get too much of a good thing, even a vitamin, it seems. A case of vitamin A poisoning has been reported by Drs. Marion B. Sulzberger and M. Paul Lazar of New York in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 30). It is believed the first such case in a grown person, though there have been a few cases of overdosage with this vitamin reported in children.

The patient was a 44-year-old woman who was losing the hair on her head when she consulted the doctors. She had already lost eyebrows and eyelashes, was having bone and joint pains, sores and cuts at the corners of her mouth and nostrils, and an itchy, dry, rough skin that peeled in many places and was a mottled brown on her forehead and cheeks.

Her trouble came from overdosing herself with vitamin A which she had been doing for a year and a half because she thought the vitamin would be good for relieving dry throat and preventing colds.

When she stopped taking the vitamin, her trouble cleared up. The New York doctors point out that because there are more potent preparations of this vitamin now than formerly, doctors should be alert to symptoms of overdosage which may come when doses previously thought safe are taken.

Besides the loss of hair and the skin trouble, their patient had menstrual changes which presumably were not due to her age, because after she stopped taking the vitamin, the cycle returned to normal.

The symptoms of too much vitamin A are much like those of too little vitamin A and of too little thyroid hormone.

You can eat your vitamin A in butter, egg yolk, cheese, liver. Yellow and green vegetables, especially carrots, supply the chemical, carotene, from which the body makes the vitamin. But if you are going to take it in pills or fish liver oil, let your doctor prescribe the dose.

Science News Letter, July 21, 1951

CHEMISTRY

World-War-Developed Chemicals Repel Insects

➤ SUMMERTIME MISERY from chiggers, mosquitoes, biting flies and many other insects can be stopped by use of the new insect-repelling chemicals developed during World War II. Of the thousands that were tested, the following mixtures are recommended as effective against a wider range of insect species and on more persons than any one of the chemicals used alone:

FORMULA 1: Dimethyl phthalate—3 parts, Indalone—1 part, Rutgers 612—1 part. FORMULA 2: Dimethyl phthalate—1 part, Indalone—1 part, Rutgers 612—1 part. FORMULA 3: Dimethyl phthalate—3 parts, Indalone—1 part, Dimethyl carbate—1 part. In these formulas, from the U. S. Department of Agriculture Bureau of Entomology, all parts are by weight.

Some repellents now on the market under trade names contain only a small percentage of the active chemical and a large percentage of alcohol or other diluting material. They may be pleasanter to use but do not give protection for as long.

These chemicals are poisonous if taken internally but are safe to use on the skin. A few persons may get a slight rash, but the number so affected is small. Keep them away from mucous membranes, eyes, eyelids, the groin and any cut places, as they well cause smarting if put on such places.

Smear the repellent evenly over exposed surfaces of the skin and repeat when insects start biting again. These chemicals will not hurt wool or cotton cloth, but they will damage rayon, sharkskin and other synthetic cloth, finger nail polish, plastic watch crystals and articles painted, varnished or made of plastics.

For further information on these newer insect repellents, write the Department of Agriculture for Bulletin E-698 (revised.)

Science News Letter, July 21, 1951

IN SCIEN

ARCHITECTURE

Modular Designs Save Costs In Building Constructions

➤ ONE WAY to save costs in building a new house is by use of what is called the modular method of design, the U. S. Housing and Home Finance Agency points out.

The modular method uses building materials which are standardized in dimensions, usually in lengths and widths which are multiples of four inches. Much of the materials used in construction, including lumber, wallboards and window frames, are now factory-constructed on this basis of measurement. If buildings are designed by architects to use only these standardized products, much waste in material and time is eliminated on the job.

For the benefit of architects, and others who are designing houses for themselves, the Housing and Home Finance Agency has issued an illustrated booklet entitled THE MODULAR METHOD IN DWELLING DESIGN. Copies are available from the Superintendent of Documents, U. S. Government Printing Office, for 25 cents. (See page 40).

Substantial economies in house building can be achieved only by cooperative efforts of materials and equipment producers, architects and builders, Raymond M. Foley, head of this government agency, states. Modular coordination provides a basic approach to one form of cooperation needed. Sufficient modular materials are now available in masonry products, windows, kitchen and other equipment to fully warrant modular planning and detailing by all architects.

Science News Letter, July 21, 1951

INVENTION

Patent Anti-Collision Device To Lessen Plane Crashes

➤ DANGER OF collision in the air of two planes would be lessened by an airplane proximity indicator on which Charles Adler, Jr., Baltimore, received patent 2,560,265. Its use would require all planes to employ special transmitting and receiving equipment.

The transmitting device would send out continuously impulses of a predetermined high frequency, and they would be sent out in all directions. Receiver equipment would pick up only this frequency. By the use of a rectangular horn-type antenna, it would pick up signals only from planes flying at about the same altitude. By a device attached to the receiver, the positions of other airplanes are indicated.

Science News Letter, July 21, 1951

ENCE FIELDS

PUBLIC HEALTH

5% Births in U. S. Without Doctor's Help

➤ A DOCTOR attends the birth of almost 95 out of every 100 babies born alive in the United States today.

The exact figure, for the year 1949, is 94.8%, the National Office of Vital Statistics reports. In 1935 the figure was 87.5%.

Biggest difference during the 15-year period came in the number of babies born in hospitals. In 1935 this was 36.5%. In 1949 it was 86.7%. This means almost three million babies were born in hospitals in 1949, which is more than twice the number of hospital births in 1940 and almost four times the number in 1935.

In recent years only one in 20 births has not been attended by a physician.

This change toward increased use of medical and hospital facilities in recent years, the Federal vital statisticians point out, has "without doubt been an important factor in the continuous decline in the infant and maternal mortality rates in the United States."

Science News Letter, July 21, 1951

NUTRITION

Nourishing Hot Weather Meals for Good Health

➤ HOT WEATHER may dull your appetite and make it hard to sleep at night. But your body needs nourishment and rest in summer as well as winter. If you are feeling tired and dragged out these warm summer days, it may be because you are eating only light snacks and staying up too late in a effort to keep cool. Regular bedtime hours for children and grown-ups will provide rest even if it is too hot to sleep soundly.

For hot weather meals, easy to prepare and eat, try nourishing, one-course salad dinners. Vegetables, including potatoes, and enough meat, fish, eggs or cheese can go into the salad to provide the protein needed. The U. S. Bureau of Human Nutrition and Home Economics suggests the following salads, but the imaginative cook will find many variations. A two-cup serving for each person provides a complete meal except for bread, beverage and perhaps dessert.

SUPER SUPPER SALAD—½ medium-sized head lettuce, 12-15 leaves chicory, 8 large leaves romaine, 1 medium-sized cucumber, 2 medium-sized tomatoes, 1 cup coarsely cut cooked chicken, 2 hard-cooked eggs, 1 cup diced cured luncheon meat, 5 pepper rings, and 4 small green onions.

Serve with a tart French dressing with crumbled blue cheese added.

HEARTY CHEF'S SALAD—2 cups shredded cabbage, 2 large romaine leaves, 20-24 chicory leaves, 2 medium-sized tomatoes, 6 radishes, 4 cooked frankfurters, 1 cup thinly sliced cooked chicken, and 4 deviled eggs.

Serve with a tart French dressing with chopped onion and green pepper added.

TROPICAL CHEF'S SALAD—20-24 chicory leaves, 8-10 romaine leaves, 1 cup shredded cabbage, 2/3 cup small pineapple pieces, 1 cup chopped celery, 1 medium-sized cucumber, 1 medium-sized carrot, 1 cup coarsely cut cooked chicken, ½ cup diced sharp cheese, ½ cup finely shredded salami.

Serve with a clear, tart oil dressing.

Science News Letter, July 21, 1951

DENTISTRY

Tooth Brushing Helps To Prevent Decay

➤ IF YOU want to keep your teeth free from decay, do your toothbrushing after each meal and each between-meals snack. Do this particularly if with the meal or snack you ate cake, candy, very sweet drinks or foods. And you might ask your dentist or doctor or both about a penicillin dentifrice.

All this is the advice implied in research just reported to the American Dental Association by Dr. Leonard S. Fosdick of Northwestern University Dental School, Chicago, and Comdr. William E. Ludwick and Capt. C. W. Schantz of the Navy Dental Corps at Great Lakes, Ill.

Brushing teeth in the morning on arising and in the evening before retiring, which is the common practice of most of us, has little effect in fighting off tooth decay, they find. This is true even when the tooth brushing is done with pastes or powders containing chemicals which can prevent acid formation from fermentable sugars such as would be left in the mouth after eating sweet and other refined carbohydrate foods. This includes the ammoniated dentifrices.

What is needed, the dental researchers state, is a substance that will have a prolonged effect in preventing acid formation. Of 10 substances they tested, including ammonia, only penicillin has a lasting effect. Used in a dentifrice or as a lozenge or mouth wash, its effect in keeping down acidophilus bacilli and acid formation lasts as long as 24 hours. A penicillin dentifrice used morning and night actually will reduce tooth decay, it has been reported.

Reason why penicillin has this lasting effect, the researchers found, is that it clings to the film on teeth. The other substances tested did not. Whether routine daily use of penicillin in tooth cleansers will result in penicillin sensitization and adverse reactions is not stated in the dental report.

Science News Letter, July 21, 1951

PSYCHOLOGY

Drop Leaflets from Sky In Psycho-War Test

➤ A CLOUD of leaflets dropping from the sky one of these days around Seattle, Wash., will not necessarily be a new advertising stunt. Rather, it will probably be a scientific experiment.

Psychologists at the University of Washington's Public Opinion Laboratory are going to test, for the Air Force's psychological warfare research, the effects of various kinds of leaflets dropped from planes. Guinea pigs in the experiments will be the people of the Pacific Northwest.

Air Force officials in Washington's Pentagon said that the strategic, rather than the tactical effects of leaflets will primarily be studied in Seattle. They said that leaflets and messages delivered by airborne loudspeakers had already proven tactically useful in Korea.

The University of Washington will carry out the research under a $100,000-a-year contract, proposed to go for three years. Called "Project Revere," the research will be under the supervision of Dr. Stuart C. Dodd, University of Washington.

Studies will be made to determine how fast messages disseminated by air-dropped leaflets spread, what per cent of the civilian population target will get the messages and how wide an area they may be expected to cover.

Science News Letter, July 21, 1951

TECHNOLOGY

Nearby Explosions Can Not Blow in New-Type Window

➤ HEAVY NEARBY explosions will be unable to blow entire windows, frame and all, into a room, if they are the new-type "bomb window" developed by the Pittsburgh Plate Glass Company of Pittsburgh, Pa. This bomb-proof window contains a glass-plastic laminate which opens by folding about its edges.

The window pane consists of three layers laminated into a single unit, Dr. J. Hervey Sherts of the company states. The outer layer is a sheet of glass, the middle layer a partially segmented sheet of polyvinyl butyral plastic, and the inner layer consists of four triangularly shaped pieces of glass with apexes meeting at the center of the window pane.

The plastic layer extends beyond the glass edges and is bolted to the window frame to serve as a hinge. This permits the inner glass segments to open like doors if the outer plate of glass is broken. The plastic is elastic and returns to near original size when the pressure is removed. The segments can then be stuck closed with tape or chewing gum until such time as the outer glass may be replaced without inconvenience.

Science News Letter, July 21, 1951

HORTICULTURE

Wealthy South, Healthy North

A more prosperous South and a better-fed North are resulting from a vegetable breeding program for the South started about 15 years ago.

By MARTHA G. MORROW

➤ A MORE prosperous South and a better-fed North are resulting from a vegetable breeding program for the South instituted about 15 years ago by the U. S. Department of Agriculture.

A number of advances can already be traced to the Southeastern Regional Vegetable Breeding Laboratory just seven miles outside of Charleston, S. C. This summer look for:

Congo watermelons. Some 25,000,000 of these tasty new melons with tough but thin rinds will be shipped north.

Contender snapbeans. Introduced only two years ago, they are already a garden favorite.

Hopes for the future:

Sweeter fresh corn-on-the-cob in May and June. Hybrids with greater sugar content are being developed for the South.

Fresh garden peas all winter long. Satisfactory varieties for winter growing in the far South are being sought.

Cabbages and tomatoes with higher vitamin C content. Increasing the nutritional value of vegetables is one of the station's aims.

Research at the Laboratory, with an eye to developing vegetables that ship well, indicates:

Thickness of the watermelon rind does not necessarily keep the melon from breaking—firmness of the flesh is more important.

Tough fibers do not prevent snapbeans from wilting—the fewer the hairs on the bean, the better the water is kept in.

Breed Vegetables Only

The only laboratory in the country devoted entirely to vegetable breeding, the Southeastern Regional Vegetable Breeding Laboratory was set up in South Carolina during the spring of 1936 to conduct basic research in the heredity and behavior of vegetable crops, and to develop vegetable varieties superior in quality and better adapted to the southeastern region of the United States.

About 37,000,000 people have their homes in these 13 states served by the breeding laboratory. This area extends westward from Virginia through Kentucky, Arkansas and Oklahoma to Texas, and includes all states south and east. Since some growing conditions are somewhat similar, the station also cooperates with Hawaii and Puerto Rico.

It seems logical that the South, having large areas of land suited to truck farming and long growing seasons in both spring and fall—and even throughout the winter in the deep South—should play a large role in supplying fresh vegetables to northern markets where some 40,000,000 city-dwellers are dependent on outside sources for their vegetables. Large quantities of market-garden produce each year are shipped north by southern growers.

But the South on the whole does not produce sufficient garden vegetables to meet its own nutritional requirements during late summer. Large quantities of fresh and processed vegetables are shipped into the South from other parts of the country. In midsummer, for instance, fresh tomatoes and head lettuce are imported from the North.

Wide variations exist throughout the South in the character of the soils, in rainfall and in seasonal temperatures. Plant diseases and insect pests to destroy crops and to spread certain diseases are found here as in other parts of the country. Nematodes, microscopic parasitic worms that damage the roots of many plants, are common. Frost in early spring and late fall, excessive heat in summer and, at times, prolonged drought in some sections combine to make vegetable growing difficult at best.

Most of the vegetables grown in the South, with the exception of certain newer varieties of sweetpotatoes, watermelons, collards, southern peas and kale, were chiefly developed in the northern states. Frequently these varieties do not grow well on such soil and in such climate as is available in these southern states.

Developed for Specific Needs

The Regional Vegetable Breeding Laboratory already is helping meet the need for varieties specifically designed to flourish in the South. Heat tolerance, disease resistance and ability to ship well are high on the list of requirements.

Vegetables developed specifically for the home gardener may be quite different from those created for the truck farmer. The truck farmer wants most of his vegetables to mature all at once; the home gardener desires vegetables that ripen over as long a period as possible. The truck farmer must be able to ship his produce to market with a minimum of damage and his crops should permit harvest by machine if possible; home gardeners hand-pick their own

WATERMELON "HAMMOCKS"—Melons, grown on trellises to conserve ground space, are supported in cloth hammocks to keep their own weight from breaking them from the stem at the U. S. Regional Vegetable Breeding Laboratory, Charleston, S. C. C. F. Andrus, senior horticulturist, is shown examining a watermelon cross.

vegetables and usually eat or process them as soon as harvested. At the laboratory more attention usually is given to the needs of the truck farmer.

The active breeding program at present is limited to seven crops. Dr. S. H. Yarnell, director of the Laboratory, also personally does the research on cabbage and sweet corn. C. F. Andrus is responsible for the tomato and watermelon breeding. J. C. Hoffman does the breeding of snap beans and lima beans. J. A. Eades devotes his time exclusively to English or garden peas.

The vitamin C in tomatoes and cabbage, niacin and sugar in sweet corn, and fiber content of snap beans are determined by Miss Margaret Kanapaux. All varieties at the Laboratory, to be considered promising, must not only grow well and look appetizing, but also be wholesome to eat.

The study of a new variety of snap bean or tomato, however, only begins at the Vegetable Breeding Laboratory. Once a promising variety has been found, it is tested in several dozen locations throughout the South. Certainly it is possible to get more information in a single season by growing a vegetable in 25 locations than by growing this vegetable in the same plot for 25 years.

The Southern Cooperative Vegetable Trials, a voluntary cooperative network throughout the South, makes it possible to compare new varieties and breeding lines with standard varieties under a wide range of conditions. In this way poorly adapted lines can be pulled out in a single season. By the end of the fourth year, it is fairly well known how a promising new variety will compare with the best ones grown commercially.

Plant breeders, pathologists and horticulturists, state research stations and individuals, in all some 70 persons work together to make these Trials a success. With a chairman for each crop, all promising varieties are thoroughly tested, irrespective of where or by whom they are developed. Those that prove satisfactory in these stringent tests are made avaliable to seedsmen, who in turn soon thereafter offer them to growers for sizable plantings. With each new variety developed, increased profits are in store for growers in the South, and often in other parts of the country as well.

Science News Letter, July 21, 1951

PSYCHOLOGY

Forced Confessions

➤ THE UNITED Nations could take action against Czechoslovakia for their third-degree methods in forcing a confession from the newspaper correspondent William N. Oatis and the grilling of jet pilot Luther G. Roland if the suggestion made by Dr. Joost A. M. Meerloo had been adopted.

Dr. Meerloo urged early this year that the United Nations declare that political intervention in the human mind to force confessions or betrayal is an international crime on a par with genocide. Such an attack on man's mind and will might be called "menticide," Dr. Meerloo proposed in a report to the AMERICAN JOURNAL OF PSYCHIATRY.

Mental torture—menticide—is the stock-in-trade of all police states, Dr. Meerloo points out. He had direct experience with menticide as a physician treating mental and physical ills under the Nazis in the Netherlands for two years.

It is a growing threat to mankind, he said—a threat far worse than genocide because it detroys free thought and makes servile, mechanical instruments of man's inviolate thought processes.

If the prisoner's mind proves too resistant under third-degree methods, Dr. Meerloo reported, narcotics are given to confuse it: mescalin, marihuana, morphine, barbiturates, alcohol. If his body collapses before his mind capitulates, he receives stimulants—benzedrine, caffein, coramine—all of which help to preserve consciousness until he confesses.

Drugs reported used by the Communists to produce confessions would not themselves be effective toward this result, according to medical opinion in this country. "Actedron," one drug reported used for this purpose, is known in the United States under the name benzedrine. It is the "pep pill" used by truck drivers to keep awake on the road and by students who want to stay awake while cramming for examinations. It might be used by the Communists to keep their victims awake during long hours of incessant questioning.

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INVENTION

Twists in Line Replace Ordinary Clothespins

➤ THE NEED for the long-used ordinary clothespin to hold the washing on the line is eliminated with a new type of clothesline on which the government has issued a patent.

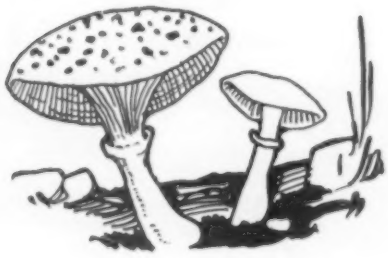
This clothesline is made up of a series of twisted wire links. The twisting is in the middle of each link. Both ends of the links are broadened to form a crossbar at one end and a hinged clasp at the other. It is this hinged piece that keeps the clothes on the line.

Patent 2,557,756 was awarded to Melvin L. Ollman, Indianapolis, Ind., for this invention. The patent covers not only the line but a container for the line as well. This container is permanently attached to the line and forms only a small package when the line is collapsed within it.

Science News Letter, July 21, 1951

BOTANY

NATURE RAMBLINGS



Honey Mushroom

➤ MOST OF us are distrustful of mushrooms, calling every fungus that we do not know a "toadstool." As a matter of fact, most of our mistrust is wasted, for there are only a few species of mushroom that are dangerously poisonous, a few more that are "tummyachers," and a good many are inedible because of toughness or ill flavor.

And "toadstool" is not a poison-name, but merely a shape-name. An edible mushroom is an edible toadstool; an inedible or poisonous toadstool is an inedible or poisonous mushroom. Anything with a stalk and cap may properly be called either toadstool or mushroom.

One of the best of these little-known and hence often suspected "toadstools" is the honey mushroom. If you walk in the shady woods you are likely to come upon dense clusters of the honey mushroom, growing about the base of an old stump, or perhaps springing up from the ground, but never very far from a tree, for even here it sends its white web of feeding threads into the roots underground. That is why foresters do not like it.

The honey mushroom, or honey agaric, as some people call it, is a most aggressive timber parasite, and since it is very abundant and widely distributed, it has considerable economic importance, especially in these days of disappearing forests.

But the mushroom gatherer has another opinion of it. It is, perhaps, not quite up to the mark of the field agaric or the shaggy-man or some of the other fungiphile's favorites, but it makes pretty good eating just the same. And it is so easy to get a basketful that one can provide mushrooms for the camp for several days in a few minutes of collecting.

The honey mushroom is easy to identify. It gets its name from the characteristic brown color of its upper surface. The cap is usually further marked with a number of sharply pointed, dark-colored scales near the middle. Underneath, the gills are white, even when the fungus has become old. The stalk is somewhat stringy and not easy to separate from the cap; this marks it off from the deadly Amanitas and from the edible Lepiotas. There is usually a ring about the stalk, though this may fray out and disappear with age; but there is no cup at the base, as in the Amanitas.

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On This Week's Cover

➤ WELDING OPERATION on a jet engine at Fairchild Engine and Airplane Corporation, Hagerstown, Md., yields a picture, shown on the front cover of this week's SCIENCE NEWS LETTER, that resembles one "from out of this world."

INVENTION

Flaming Gases Melt Ice on the Roadway

➤ ICE ON the roadway will be no barrier to motor vehicles equipped with a melting device invented by Jack L. Hamblin, Portsmouth, Ohio, on which he received patent 2,560,221. With it, flaming gases hit the roadbed just ahead of the driving wheels.

Bottled gas, the kind used in many rural homes for cooking and heating, is the fuel employed. The tank holding it is placed in the baggage compartment. Ignition is by electricity from the vehicle's electrical system. Lighting the burners, and control of the flow of gas and the direction of the resulting flames are made by the driver without leaving his seat.

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PSYCHIATRY

Work, Play for Health

➤ WORK AND play are good medicine for hundreds of thousands of patients in mental hospitals, Dr. Daniel Dancik, chief of the physical medicine rehabilitation service of the Veterans Administration Hospital at Northport, L. I., declared at the meeting of the American Medical Association in Atlantic City, N. J.

"The radical cure for mental illness has not been found except for those early stages when the process still is wholly reversible," Dr. Dancik said.

The neuropsychiatric patient, he explained, invariably can not work or play.

"Therefore, to teach such a patient how to work and how to play is to teach him how really to adjust," Dr. Dancik said. "This best describes the function of physical medicine in a large neuropsychiatric hospital. Physical medicine must make it possible for the patient to find an outlet for his instinctual urges in work and play.

"These should be properly guided and taught. The activities should be selected for the patient's special needs, interest and capacity and all these activities should be graded and expanded. Idleness is debilitating, especially when for some reason or other it is prolonged. This is especially true for the chronic psychotic."

Properly prescribed activity, he said, releases emotional stresses and strains, develops initiative and confidence, fosters morale and feelings of well-being and enhances security and self respect.

Many patients who do not fit into the occupational training program adjust themselves to training in office procedures.

"This in itself," Dr. Dancik pointed out, "makes for realism and recognition of the patient's capabilities and at the same time fosters ideal patterns of behavior."

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INVENTION

Metals Polished Electrically By Intermittent Currents

➤ BRILLIANT POLISH or high luster is obtained on articles of silver plate, copper or brass by a process using the electrolytic bath which brought Henry Boynton Smith, Wallingford, Conn., patent 2,559,263. Rights are assigned to R. Wallace and Sons Manufacturing Company of the same address.

In this electropolishing method, as the process is called, the inventor has found that a polish or luster of high brilliance is obtained on the surface of silver plate, copper or brass by using a composite electrical voltage made up of direct and alternating current potential applied intermittently.

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ASTRONOMY

Spy on Sun's Outer Surface

Two powerful new, 26-foot coronagraphs, to give man-made eclipses, are under construction for installation at Climax and Alamogordo.

➤ TWO POWERFUL new instruments for spying on the sun are now under construction. The world's largest, these 26-foot coronagraphs, designed to produce man-made eclipses of the sun, will probably go into operation late this year.

Although designed for basic research, these twin instruments may make possible more accurate long-range forecasting of radio blackout, magnetic disturbances, and unusually brilliant northern lights. They may even conceivably some day lead to accurate long-range forecasting of weather here on earth.

Two coronagraphs are considered a minimum if scientists are to get at least one set of basic observations daily. One will be installed at the High Altitude Observatory of Harvard University and the University of Colorado, at Climax, Colo., some 11,000 feet high. The other will be at a companion station on Sacramento Peak, near Alamogordo, N. Mex. Meteorological records indicate that unavoidable seasons of bad weather do not tend to occur simultaneously at the two locations.

A coronagraph enables man to study the day-to-day changes in the sun's corona or outer envelope, which is too faint to be seen except during an eclipse when the blinding light of the sun's disk is blocked out. The first instrument to do this artificially was designed only about two decades ago.

Fitted with highly sensitive filters, coronagraphs also patrol the prominences, great masses of gas that shine spectacularly around the sun's limb. Occasionally these jets of hot luminous material rocket upward a quarter of a million miles or more, then fade or splash back on the solar surface.

The two instruments were designed by astronomers of Harvard College Observatory and the High Altitude Observatory of Harvard University and the University of Colorado. Sponsoring development and construction of the big solar telescopes are the Office of Naval Research, the Air Force Research and Development Command and Research Corporation.

Skilled craftsmen at the Westinghouse Electric Corporation are now busy constructing the mechanical mounts for the two 26-foot instruments.

Magnetism is now believed to be as important as gravity in controlling the motions of gases in the solar atmosphere, points out Dr. Donald H. Menzel of Harvard Observatory. The invisible lines of magnetic force act like soft springs and sag under the weight of the solar prominences, but tend to give some support to them.

Science News Letter, July 21, 1951

DENTISTRY

Thumb-Suckers' Hay Rake

➤ THE CHILD who persists in sucking his thumb after he is more than three and a half years old should have a device called a "hay rake" to help him stop the habit. This advice comes from Dr. Edward S. Mack of San Francisco, instructor in dentistry for children at the School of Dentistry, College of Physicians and Surgeons.

Dr. Mack agrees with psychiatrists and child psychologists that thumb-sucking often persists because the child has some emotional difficulty or need. He points out that it is rare in an only child, suggesting that the child who has to share his parents' love and attention may take to thumb-sucking to comfort himself in such a situation. He urges that parents make the young child feel loved and secure and that emotional difficulties should be straightened out. Thumb-sucking may stop when this is done, he states. But, he points out, there is usually a time lag between straightening out the emotional difficulties and the stopping of the sucking.

"The time lag is often long enough to permit further indulgence in the habit. This time lag may exist for months or even years. During this period, an 'empty habit' persists," he states.

Dr. Mack disagrees strenuously with child specialists who claim that thumb-sucking does not cause mouth and jaw deformities. In a report in the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (July) he lists possible effects of thumb-sucking as abnormal development of jaws, missshapen nose and lip structure, irregular permanent teeth, speech defects and mouth breathing that may lead to respiratory infections.

The "hay rake" suggested as the most effective way of breaking the habit consists of a "series of tines which acts as a fence to prevent thumb-sucking and tongue-thrusting." It is temporarily cemented to the teeth to "constantly remind the tongue to keep behind the appliance" and the thumb to stay out of the mouth. Used properly, Dr. Mack states, it is "always successful."

Science News Letter, July 21, 1951

INVENTION

Improved Ceramics Are Of Varying Hardnesses

➤ IMPROVED CERAMICS, suitable for ornamental uses and for industrial applications ranging from bearing parts to abrasives, are of the type made with metallic oxides but have varying hardness qualities depending upon the amount of titanium oxide included in them.

These ceramics contain titanium oxide, copper oxide, and two or more of the group composed of oxides of iron, cobalt, nickel and chromium. The characteristics of the composition depend upon the amount of titanium oxide, which may vary up to 65% of the total. Patent 2,560,188 was issued to Daniel Rosenthal, Brooklyn, N. Y., on this invention.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

THE ADOLESCENT PERIOD: A Pictorial Atlas—Frank K. Shuttleworth—*Child Development Publications*, 69 p., illus., paper, $2.00. A monograph illustrating the processes of physical growth, sexual maturation, and differences in body builds among normal adolescents.

ALKALI SOILS: Their Formation, Properties and Reclamation—W. P. Kelley—*Reinhold*, 176 p., illus., $5.00. This work is intended primarily for research workers, university teachers of soils and agronomy, and those who work with the soil.

AMERICAN BIRD SONGS, VOLUME II—P. P. Kellogg and A. A. Allen—*Comstock Publishing Company*, Five 12-Inch 78 R. P. M. Vinylite Records, $10.50. The songs of 51 birds recorded in their natural habitats for the Albert R. Brand Bird Song Foundation, Cornell University.

BIRDS OF MONTEZUMA AND TUZIGOOT—Henry H. Collins, Jr.—*Southwestern Monuments Association*, 13 p., illus., paper, 25 cents. The first in a series of booklets designed to aid the national park visitor in identifying the common species of birds in that area.

BUILDING AMERICA'S MIGHT: Report to the President No. 1—Charles E. Wilson—*Office of Defense Mobilization*, 43 p., illus., paper, 25 cents. An account of the progress made in expanding America's military strength and productive power to meet the challenge of outright communist aggression.

ESSENTIALS OF EXPERIMENTAL CHEMISTRY—Alfred B. Garrett, Joseph F. Haskins, Harry H. Sisler and Margaret H. Kurbatov—*Ginn*, 326 p., illus., paper, $2.80. A manual which serves the dual purpose of a laboratory workbook and a lecture-demonstration notebook.

EVOLUTION—A. Franklin Shull—*McGraw-Hill*, 2nd ed., 322 p., illus., $5.00. Those who have used this standard text will welcome this new edition which is largely rewritten.

GENERAL ZOOLOGY—Tracy I. Storer—*McGraw-Hill*, 2nd ed., 832 p., illus., $6.00. An introduction to zoology dealing with the general principles of animal biology and with the structure and physiology of common and representative types.

GOVERNMENT PROJECT—Edward C. Banfield—*Free Press*, 271 p., $3.50. An account of the U. S. government's attempt to remake the lives of a few "desperately poor" citizens by establishing a cooperative farm in Arizona.

GREAT EXPERIMENTS IN PSYCHOLOGY—Henry E. Garrett—*Appleton-Century-Crofts*, 3rd ed., 358 p., illus., $3.50. Describing for the beginning student such important work as Pavlov's Conditoned Reflex, Thorndike's Laws of Learning, the Weber-Fechner Laws, etc.

A HISTORY OF NEUROLOGICAL SURGERY—A. Earl Walker—*Williams and Wilkins*, 583 p., illus., $12.00. A story that starts with the earliest recorded beginnings and takes you through the initial trials and struggles that led to our most intricate modern techniques.

THE HOUSEFLY: Its Natural History, Medical Importance, and Control—Luther S. West—*Comstock*, 584 p., illus., $7.50. Useful in planning an all-out war against this enemy of man.

INDUSTRIAL HYGIENE—H. H. Schrenk—*Mellon Institute*, 2 p., paper, free upon request to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa. A report covering nitrogen oxides, sulfur dioxide, and sulfuric acid mists.

AN INTRODUCTION TO THE CHEMISTRY OF THE SILICONES—Eugene G. Rochow—2nd ed., 213 p., illus., $5.00. Describing this new family of compounds which has found so many important industrial uses.

AN INTRODUCTION TO THE THEORY OF CONTROL IN MECHANICAL ENGINEERING—R. H. Macmillan—*Cambridge*, 195 p., $6.00. A book concerned with the methods, principles of the new theory of "control" rather than with specific application.

THE MODULAR METHOD IN DWELLING DESIGN—Housing and Home Finance Agency—*Govt. Printing Office*, 54 p., illus., paper, 25 cents. This booklet illustrates graphically how the architect and the people who design their own home may save material and construction costs through a design which makes use of standard sizes of materials.

OBSERVING THE HEAVENS—Peter Hood—*Oxford University Press*, 64 p., illus., $1.75. A picture book to introduce young people to the heavens.

THE PHILOSOPHY OF REHABILITATION—J. E. M. Thomson—*Mellon Institute*, 3 p., paper, free upon request to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa. This pamphlet stresses the need to restore the handicapped person to economic independence.

POWELL OF THE COLORADO—William Culp Darrah—*Princeton University Press*, 426 p., illus., $6.00. This is the life story of Major John Wesley Powell, who organized and led two great expeditions down the Colorado to chart its course and collect scientific data.

QUANTITATIVE ORGANIC MICROANALYSIS: Based on the Methods of Fritz Pregl—Julius Grant—*Blakiston*, 5th ed., 342 p., illus., $5.50. An up-to-date textbook covering the methods of leading microanalysts and with full bibliography.

SCIENCE AND THE LAND: The 71st Annual Report of the New Jersey Agricultural Experiment Station, 1949-1950—*Rutgers University*, 168 p., illus., paper, free upon request to New Jersey Agricultural Experiment Station, Rutgers University, New Brunswick, N. J. Information on agriculture presented in a question and answer form.

THE SCIENTIFIC PAPER: How to Prepare It, How to Write It—Sam F. Trelease—*Williams and Wilkins*, 2nd ed., 163 p., $2.50. A handbook for students and research workers in all branches of science.

STUDIES IN THE BROMELIACEAE, XVI: Contributions from the U. S. National Herbarium, Volume 29, Part 10—Lyman B. Smith—*Govt. Printing Office*, 91 p., illus., paper, 50 cents. This paper is the sixteenth of a series of studies of the botanical family Bromeliaceae and includes 16 new species.

A SURVEY OF INDIAN RIVER ARCHAEOLOGY, FLORIDA—Irving Rouse—and CHRONOLOGY AT SOUTH INDIAN FIELD, FLORIDA—Vera Masius Ferguson—*Yale University Press*, 358 p., illus., paper, $4.00. The two papers in this volume are published in connection with the 1944-1949 Florida project of the Caribbean Anthropological Program, Yale Peabody Museum.

TABLES RELATING TO MATHIEU FUNCTIONS: Characteristic Values, Coefficients, and Joining Factors—*Columbia University Press*, 278 p., $8.00. Tables prepared by The Computation Laboratory of the National Applied Mathematics Laboratories, National Bureau of Standards.

WORKERS IN SUBJECTS PERTAINING TO AGRICULTURE IN LAND-GRANT COLLEGES AND EXPERIMENT STATIONS 1950-1951—Mildred T. Jackson—*Govt. Printing Office*, 213 p., paper, 45 cents. A directory.

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INVENTION

New Process Yields More Furfural from Corncobs

➤ FURFURAL, for making nylons and for many other industrial applications, is made from corncobs, oat hulls, or cottonseed hull brans and rice hulls in greatly increased quantities by a process on which a patent has been issued.

Inventors of the process, technically for the production of furfural from pentose liquors, are John W. Dunning, Charles F. Frye and Elbert C. Lathrop, all of Peoria, Ill. Patent 2,559,607 was awarded to them. Rights have been assigned to the United States government as represented by the Department of Agriculture.

Production by the process is from aqueous solutions of pentoses, particularly xylose. It is a continuous process that consists of heating a solution containing 1.5% to 10% xylose and 1.5% to 5% sulfuric acid, at about 150 degrees Centigrade, to convert the xylose to furfural. Important in the method is maintaining the concentration of furfural in the conversion below 0.7%, which is done by a special removal process.

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MEDICINE

Clue to Lung Cancer

➤ RHEUMATIC ACHES and pains in the joints and long bones with swelling of the finger and toe joints may provide an important clue for early diagnosis of lung cancer.

Five cases of lung cancer in which these symptoms were the first significant ones and a sixth case in which these symptoms were present are reported by Drs. John D. Pattison, Jr., of Toledo, Ohio, and Drs. Erwin Beck and William B. Miller of Pittsburgh in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 30). Five of the patients were seen at the Veterans Administration Hospital at Aspinwall, Pa.

The symptoms are part of a disease called hypertrophic osteoarthropathy. It almost always is secondary to an acute or chronic disease of the lungs or other internal organs.

The disease often is mistaken for rheumatoid arthritis. Many patients with lung cancer have been treated for many months as arthritics before a chest X-ray revealed the lung condition, Dr. Pattison and associates point out.

They stress that the rheumatism-like symptoms usually appear long enough before lung symptoms to allow successful removal of the cancer. The aches and pains in hands and feet clear up with dramatic speed after the cancer has been removed.

The enlargement of the hands and feet in some of these cases make them look something like persons suffering from the pituitary gland disase, acromegaly.

Persistent hoarseness and cough are other symptoms of early lung cancer which should not be ignored. The rheumatic disease gives doctors one more early signal.

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BIOPHYSICS

Sense of Smell Baffles

➤ SCIENCE IS not yet sure how you smell a rose, a broiling beefsteak, your girl's favorite perfume or any other odor.

Tests reported in Los Angeles call in question the heat absorption theory of sense of smell put forth in 1947 by Drs. Walter R. Miles and Lloyd H. Beck, Yale University psychologists.

The Miles-Beck theory says that the substance producing the odor gives off a gas that absorbs infrared or heat radiation of certain wavelengths given off within the nose. This loss of heat detected in the nose's olfactory sense organ is signaled to the brain and interpreted as the sensation of odor. They did their original work on bees. Earlier theory held that odor is a chemical sense, aromatic particles hitting the nose and going into solution on its moist inside lining.

Now Drs. A. Theodore Forrester and Wm. E. Parkins of the physics department at University of Southern California have set up tests that they feel do not support the infrared theory. Odor-containing air kept at constant temperature of the body and breathed by a person still produced the sensation of odor, whereas the experimenters suggest under the Miles-Beck theory this should not be the case.

Such tests are not considered conclusive, and they suggest a further test of the theory by inserting into the nasal passages a sealed tube of odorous gas in a container transparent to the heat rays that are supposed to be absorbed to produce the odor effect.

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MEDICINE

75 Have Frostbite Damage

➤ ONLY 75 of the 2,500 men who suffered frostbite during the withdrawal from Chosen Reservoir in Korea last winter lost any toes or, in medical terms, "had any permanent loss of substance."

These figures were announced by Capt. E. R. Hering, of the Navy Medical Corps, at the meeting of the American Medical Association in Atlantic City, N. J.

Capt. Hering contradicted some of the reports on frostbite during the "dramatic and bloody withdrawal from the Chosen Reservoir" last winter.

"We had good clothing in sufficient quantity and the men had been indoctrinated, although they were not trained Arctic troops by any means. But the very nature of that fight," he declared, "made it impossible for the troops to take all precautions. Men would struggle up the steep hills to drive out the Chinese and protect the column of vehicles. Their feet would perspire and then they would be pinned down and the sweat would turn to ice. They had no facilities for drying socks and even changing them must have been difficult. Men arrived in Hogaru with a shell of ice around their feet inside their boots."

The criteria for deciding which cases would be evacuated and which would fight their way back with their comrades, when every man capable of bearing a rifle was needed, were the feet of the Fifth Regimental Surgeon. He refused to be evacuated, although he could not walk without great pain, but instead insisted on riding in an ambulance with his medical section. The men with feet worse than his were evacuated, Capt. Hering personally passing on all controversial cases.

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● RADIO

Saturday, July 28, 1951, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Robert R. Williams, a chemist widely known for his synthesis of vitamin B, and assistant to the president of the Research Corporation, will discuss "Enriching Rice for World Health."

INVENTION

Portable Drink Dispenser Ends Empty Bottle Menace

➤ UMPIRES AT ball games may welcome a portable "drink" dispensing device, which received a patent from the government, in which the beverage is carried in bulk and sold by the cup instead of by the bottle.

It consists of a double-walled tank that is worn on the back of the salesman. The inner section holds the beverage. Between the two walls, cold air circulates. Solid carbon dioxide, so-called dry ice, is used to chill the circulating air and consequently the beverage.

The inventor is Art Kassel, Van Nuys, Calif. Patent 2,558,181 was awarded to him.

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• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 579. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

RAZOR BLADE sharpener, an improved type operated electrically that enables a double-edge blade to give 100 good shaves, has six revolving leather rollers, two of which are impregnated with a fine abrasive. It operates on either direct or alternating household current.

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SPRAY NOZZLE, which can be used with the ordinary garden hose to fight fires inside buildings, gives a fog that will instantly blanket and extinguish oil, textile and wood fires. The same fog nozzle can be used for spraying lubricants and other solutions.

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VINYL PLASTIC window shades, available in several colors and sizes, add fire-protection to such desirable qualities as pleasing appearance and being washable, and are colorfast and rainproof. They will char but not flame.

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ROTATING RED light for airplanes, a safeguard in flight, is a 75-watt lamp of 15,000 beam candlepower mounted under a red plastic dome atop the vertical stabilizer. Two revolving reflectors over the lamp cast fan-shaped beams 180 degrees apart in the horizontal plane.

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GOOSE SKIN, for uses ranging from trim for negligees to powder puffs, is made by tanning the pelt with the down on, then dyeing the down. The result is a soft warm pelt, as shown in the photograph, that can be finished in black, white or many pastel shades.

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PROPELLERS for use on lighter-than-air ships, commonly called blimps, enable them to move forward, backward or to hover in a stationary position by means of a special transmission device. This electrically-operated transmission in the propeller hub gives quick-responding control.

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ELECTRIC LAWNMOWER, an improved type in a plastic casing that can not rust or corode, has an electrically driven rotating steel blade that cuts when the mower is pushed forward or pulled backward. The blade makes 1,750 revolutions per minute which assures clean cutting.

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POCKET STOVE, so called because of its tiny size, consists of three metal parts that fit together like a match box but which can be assembled to form a shelf between two uprights. A chemical pellet, placed on the shelf and lighted with a match, provides heat enough to boil water or fry an egg.

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Do You Know?

Thunder is the sound waves resulting from the rapid expansion, really an explosion, of the air along the path of a lightning flash.

Peat is a product of decayed vegetation, mostly of such aquatic plants as reeds, rushes, mosses and sedges.

Rats harbor and carry the germs of six diseases serious to man.

Some of the world's strongest *steel wire* is used for banjo and guitar strings; it is drawn so fine that a pound of steel will equip nearly 1,500 banjos with strings.

Sugarcane *wax* is a relatively new American product.